

REMARKS/ARGUMENTS

Favorable reconsideration of this application in view of the above amendments and following remarks is respectfully requested.

Claims 9-14, 21-22 and 25-28 are pending in this application. By this amendment, Claims 9, 12 and 25-28 are amended; Claims 17-20 and 23-24 are canceled; and no claims are added herewith. It is respectfully submitted that no new matter is added by this amendment.

In the outstanding Office Action, Claims 9-28 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 3,830,261 to Hochberg in view of U.S. Patent No. 5,813,704 to Naito.

It is respectfully submitted that the applied art does not teach or suggest that a buffer material covers the outer face from a bottom of the troughs to a height that is 0.5 to 2.0 times the height of ridges, and the buffer material is a rubber composition comprising at least one rubber selected from the group consisting of polyisobutylene, acrylic rubbers, hydrogenated nitrile rubbers, epichlorohydrin rubbers, butyl rubbers, chlorosulfonated polyethylene rubbers, and chlorinated polyethylene rubbers, as recited in Claim 9. These features are neither taught nor suggested by the applied art of Hochberg and Naito either alone or in combination.

Instead, Hochberg discloses as shown in Fig. 1, a tube 10 in the form of a body of a fuel line having a hollow interior defined by a hollow core. The tube 10 is surrounded by an overlap 12 which is surrounded by sealant layer 14 that works as sealant material. The sealant material is intended to be maintained in a state of compression so that it quickly reverts to its original shape and prevent the loss of fuel when punctured by a projectile. As such, the material for the sealant layer 14 must be characterized by the capability of reacting with fuel to swell so as to close a puncture in the fuel line and thereby prevent fuel from

escaping. Please see the discussion in Hochberg in column 2 line, 66 through column 3, line 11. Even further, as set forth in Claim 1 of Hochberg, the purpose of the sealant layer is to be “capable of reacting with fuel to swell so as to close a puncture in the fuel line and thereby prevent fuel from escaping. As such, Hochberg discusses that natural rubber and non-fuel resistant silicone rubber, such as the dimethyl silicone rubber, are suited for this purpose. Please see the discussion in column 3, lines 4-10.

In contrast, the buffer material in one or more embodiments of the present invention does not work as sealant material. In the present invention, sealing for the vibration-absorbing tube is provided by the bellows. The buffer material absorbs vibration to improve vibration absorbency of the tube. Therefore, in case that bellows are punctured when the vibration-absorbing tube is penetrated by a projectile and the like, the vibration-absorbing tube would be destroyed to lose sealing capability and thus become unable to perform intended function. The buffer material in the present invention is not expected to swell when reacting with fluid and has no need to do so. As such, Claim 9 is amended to recite that the buffer material is at least one rubber selected from the group consisting of polyisobutylene, acrylic rubbers, hydrogenated nitrile rubbers, epichlorohydrin rubbers, butyl rubbers, chlorosulfonated polyethylene rubbers, and chlorinated polyethylene rubbers.

Applicants submit that the buffer material (rubber) in Hochberg is completely different from non-fuel resistant silicon rubber such as the above-mentioned natural rubber and dimethyl silicon rubbers. Thus, Hochberg’s invention and the present invention have quite different purposes and applications. Further, the sealant material (layer) to be used in Hochberg’s invention and the buffer material to be used in the present invention are also quite different from each other in not only its capability, characteristics and purpose and also the specific material to be used.

Naito discusses the flexible joint shown in Figs. 1 and 2, which includes a braid 2 and protectors 3a, 3b on a lateral side surface 11a of the ridge part 11 at both end parts of the wave-shaped bellows 1. The Office Action asserts that Hochberg's invention is applicable to Naito's flexible joint. Applicants disagree. Specifically, as discussed in the Background section of Hochberg, Hochberg relates to a hollow body for fuel lines in military aircraft, see column 1, lines 6-11. Hochberg is intended to "provide a light weight hollow body which seals itself after being penetrated by a foreign object (such as a projectile)." See column 1, lines 59-60. In contrast, the present invention relates to vibration-absorbing tubes used in refrigerant systems of air conditioners, dehumidifiers, refrigerators, and the like provided with compressors, which generate vibration, or used in other piping systems which generate vibration. See at least page 1, lines 3-7 of the present invention. The features of the present invention are intended to provide a vibration-absorbing tube that maintains a high durability for long life while being superior in vibration absorption. See for example, page 4, lines 17-20.

The vibration-absorbing tubes in the present invention are applied to the products for above-mentioned general industry, not for military purpose. Naito relates to the flexible joint that is a part of the products used for general industry and is intended to "provide a flexible joint which is durable, which is and easy in its assemble and which has spring constant that can be easily set." See at least the Abstract of Naito. Accordingly, Hochberg's invention and Naito's flexible joint are to be used and applied for quite different purposes. Again, Naito's flexible joint is for general industrial purpose, not for military, and thus Hochberg's invention is not contained in the scope of Naito's invention. Since the products for general industrial purpose are not assumed to be attacked by the projectile such as bullets, and if such emergency occurs, not only tubes but also the whole body of air conditioners, refrigerator, automobiles, etc. is to be destroyed, in which case, one of ordinary skill in the art would not

apply Hochberg's invention to Naito's flexible joint to arrive at the claimed invention.

Accordingly, Applicants submit that the claimed invention is not obvious from combination of the applied art and the asserted combination is based on hindsight reasoning.

Further, in addition to the type of buffer material recited in the claimed invention as discussed above, Claim 9 also recites that the buffer material covers the outer face from the bottom of the troughs to a height that is 0.5 to 2.0 times the height of ridges. In accordance with these features of the claimed invention, it is possible to provide a vibration-absorbing tube with high vibration absorbency, whip resistance and pressure resistance, like a tube for example for a refrigerant circuit for air-conditioners. These characteristics are available under the severe use environment subject to vibration from operating compressor as well as vibration due to repeated high pressure (max. approx. 15MPa) of refrigerant from the compressor.

The Office Action asserts on pages 2-3 that it would have been obvious to one of ordinary skill in the art to apply the foam material to bellows with troughs and ridges to cover them. The Office Action further asserts that discovering an optimum value of a result effective variable involves only routine skill in the art. However, it is well established that a particular parameter must first be recognized as a result-effective variable before the determination of the optimum or workable ranges of the variable might be characterized as routine experimentation. See *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). As discussed above, Hochberg is concerned with providing sealant material that maintained in a state of compression so that it quickly reverts to its original shape and prevent the loss of fuel when punctured by a projectile. The material for the sealant in Hochberg must be capable of reacting with fuel to swell so as to close a puncture in the fuel line and thereby prevent fuel from escaping. There is no suggestion in Hochberg for optimizing vibration absorbance. Thus, Hochberg does not recognize the effects of providing buffer material at a particular

height with respect to troughs and ridges. Applicants submit that Claim 9 patentably distinguishes over Hochberg for at least this reason.

Further, as shown in the test results in Table 1 on page 22 of the present specification, the claimed buffer material achieves such high performance under various conditions that vibration absorbency is less than - 8.9dB, whip resistance is more than 200 hours, and pressure resistance is more than 200,000 times under 0 to 15 MPa and 100,000 times under 0 to 21 MPa. The test results prove the advantageous effect of the features of the present invention. Such characteristics and effects specific to the claimed vibration-absorbing tube are not disclosed in either Hochberg or Naito, and it is also not possible to predict such characteristics and effects from the teachings in the applied art.

Accordingly, Applicants submit that one of ordinary skill would not have been motivated to apply Hochberg's invention to Naito's flexible joint for modification. Again, the present invention is fundamentally different from Hochberg's invention in the overall subject matter, and the present invention demonstrates advantageous effects which are not disclosed in either Hochberg or Naito. The features of the claimed invention are not taught or suggested in the applied art, and therefore, the applied art cannot provide at least the advantages discussed above.

Accordingly, withdrawal of the rejection of the claims under 35 U.S.C. § 103(a) is respectfully requested.

Consequently, for the reasons discussed in detail above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance is earnestly solicited.


Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below listed telephone number.

Respectfully submitted,

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